

Peritoneal Tuberculosis with Negative TB Testing in an Adolescent

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Abstract

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium TB* with the lungs being the primary target.

Keywords: Tuberculosis (TB); Abdominal TB; Anti-Tuberculous Drugs

Introduction

Abdominal TB involving the gastrointestinal tract, peritoneum, lymph nodes, and/or solid organs constitutes around 5 percent of all cases of TB worldwide [1] and the peritoneum remains the most common site of extrapulmonary involvement [2]. Peritoneal TB can mimic abdominal malignancies in different aspects, including clinical presentation and radiological findings making the diagnosis challenging [3]. The importance of a true diagnosis lies in providing the appropriate treatment to decrease disease related mortality which has been estimated to be 50% before the availability of anti-tuberculous drugs [4].

Case Presentation

14 y.o. old female patient presented to our center with a 3 months history of abdominal pain, increased abdominal girth, and weight loss. Clinical History was significant for progressive marked worsening of her symptoms, with substantial fatigue, severe abdominal and back pain, anorexia and weight loss of 6 kg during

the same period. Social history revealed that the patient lives in a rural area in Lebanon, the mother was a healthcare worker and the father a military personnel. On presentation the patient had stable vital signs but was ill appearing. Her physical exam was remarkable for pallor, abdominal distension, large ascites and lethargy. Open abdominal laparotomy had been done early in the course of illness before presentation to our center revealing gross granulomas, and peritoneal biopsy done showed granulomatous inflammation with minimal focal punctate non caseating necrosis. Differential diagnoses at that time included sarcoidosis/inflammatory/infectious etiologies. Initial lab workup at our institution was within normal limits except for elevated inflammatory markers (CRP: 70 mg/l). Abdominal scan showed ascites with peritoneal nodules (Figure 1 and 2), while chest imaging was normal. Ascitic fluid analysis showed white cell count of 320 mm³ with 62% lymphocytes, protein and albumin levels of 62.7 g/l and 27.2 g/l, respectively, with a serum to ascites albumin gradient of 7.8 g/L, fluid to serum LDH levels of 0.6. Peritoneal fluid tested negative for TB by PCR and Acid

Fast Bacillus (AFB) Stain. Mycobacterial culture from peritoneal fluid was later reported negative. Additional workup done at our center including serum angiotensin converting enzyme (ACE), LDH and IGRA, all of which were negative. Peritoneal fluid cytology assessment was negative for malignant cells. PPD test was positive (more than 15 mm). In light of persistence of clinical symptoms, positive PPD test, evidence of granulomas, absence of other explanation, and the fact that tuberculosis was highly suspected, she was started on anti-tuberculous medications (Isoniazid, pyrazinamide, rifampin, and ethambutol). She received the quadruple regimen for 2 months, after which she was switched to Isoniazid and rifampin that she is still maintained on (3 months so far). Patient showed a marked improvement in her symptoms, with almost complete resolution of the ascites and nodules on F/U abdominal imaging.

Figure 1: Axial contrast enhanced CT scan of the chest with lung window demonstrating pleural based nodularities involving the right lower lobe.

Discussion

Tuberculosis remains the leading cause of infectious diseases-related deaths worldwide [5]. In immunocompetent hosts, extrapulmonary TB constitutes 15 - 20% of all tuberculosis cases, with higher percentages seen in immunocompromised hosts. Peritoneal tuberculosis is a rare occurrence, responsible for 0.1% to 0.7% of tuberculosis [6]. The nonspecific symptoms (abdominal pain, fever,

Figure 2: Axial (2a) contrast enhanced CT scan of the abdomen and pelvis with coronal (2b) reformat demonstrating large amount ascites and nodular thickening of the peritoneal coverages.

fatigue and weight loss) and radiological findings (ascites, nodular irregularities in the peritoneal surface nodules) make the diagnosis a challenging one. Elevated CA125 tumor marker is seen sometimes with peritoneal TB [7] making the differentiation between peritoneal TB and abdominal malignancy more difficult. Several diagnostic methods have been used for the diagnosis of peritoneal TB including Tuberculin skin test which should be interpreted cautiously, as despite its high specificity, it has a low sensitivity, and a positive predictive value of 50 - 67% [8]. Another commonly used test of which utilization has been rising over the last 10 years is IGRA which measures the cytokine release by lymphocytes and was found to have a higher accuracy when used in the extra-sanguineous body fluids as compared to blood [9]. Moreover and while mycobacterial culture has the highest sensitivity in diagnosing pulmonary TB, positivity rates range between 21 - 35% [10,11] in peritoneal TB, and Acid-fast bacilli staining of aspirated ascitic fluid have a low sensitivity of 3% in diagnosing peritoneal TB [10,11]. The utilization of TB PCR in the diagnosis of extrapulmonary TB has been assessed by several studies which reported a sensitivity of around 94% [12]. Biopsy is still the gold standard for the diagnosis of peritoneal Tuberculosis, with around 100% sensitivity. Our patient underwent peritoneal fluid testing for TB by PCR twice with negative results. However, the presence of granulomatous nodules, the negative workup for malignancy and persistent symptoms, have increased the index of suspicion for TB, and accordingly

patient was started on anti-tuberculous medications. She showed a significant clinical and radiologic response after a few months. This probably confirms the diagnosis of peritoneal TB, even in the setting of negative PCR testing, in keeping with 2 previous cases of peritoneal TB with negative PCR testing [13].

Conclusion

In conclusion, peritoneal TB diagnosis should be considered in the differential diagnoses of patients with abdominal pain, distension and weight loss even in the presence of negative testing, when workup is negative for other disease processes.

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